

- DRAFT for Public Review -

**COMPATIBILITY DETERMINATION
on**

**NCDOT REQUEST
for**

**N. C. HIGHWAY 12 RIGHT-OF-WAY PERMIT
on**

PEA ISLAND NATIONAL WILDLIFE REFUGE

DARE COUNTY, NORTH CAROLINA



**U. S. FISH AND WILDLIFE SERVICE
ALLIGATOR RIVER NATIONAL WILDLIFE REFUGE COMPLEX
MANTEO, NORTH CAROLINA**

February 2012

U. S. FISH AND WILDLIFE SERVICE

COMPATIBILITY DETERMINATION

Use: Replacement of the Herbert C. Bonner Bridge (Bridge No. 11), Project B-2500 on NC 12 over Oregon Inlet at Pea Island National Wildlife Refuge

Refuge Name: Pea Island National Wildlife Refuge

Establishing and Acquisition Authority (ies): Executive Order 7864 - April 12, 1938

Refuge Purpose(s): “ — as a refuge and breeding ground for migratory birds and other wildlife — “

National Wildlife Refuge System Mission:

To administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

Description of Use:

Phase I Bridge Replacement Project (B-2500):

The North Carolina Department of Transportation (NCDOT) is planning to replace the Herbert C. Bonner Bridge (Bridge No. 11) on NC 12 over Oregon Inlet at Pea Island National Wildlife Refuge because it has reached the end of its service life. The NCDOT has requested an **amendment to their existing right-of-way (ROW) for NC Highway 12 to construct the new Herbert C. Bonner replacement bridge on Pea Island National Wildlife Refuge.** A Final Environmental Impact Statement and Section 4(f) Evaluation (FEIS) and Record of Decision (ROD) were prepared to evaluate impacts from two basic alternatives under the National Environmental Policy Act (NEPA). Based upon the preferred alternative selected for design and construction, a new right-of-way permit request was submitted to the Refuge. The NCDOT record of NEPA documentation and the selected alternative can be viewed at <http://www.ncdot.org/projects/bonnerbridgerepairs/>.

Terminal Groin required by NCDOT for this Phase I Bridge Replacement Project (B-2500):

As part of the overall B-2500 project, **NCDOT made retention of the Terminal Groin a requirement of the bridge replacement.** The Terminal Groin was constructed 20 years ago to protect the Bonner Bridge under a separate permit. For the new purpose to protect a replacement bridge, a separate compatibility determination and Permit were prepared for the Terminal Groin to remain. Even though there is a separate Permit, the Terminal Groin is part of the overall B-2500 project.

Availability of Resources:

This bridge replacement project is now in the design/build stage so it is difficult to assess the overall demand on refuge resources. Since 2001, the project planning phase has generated substantial demands on refuge staff time. The design/build process for the alternative selected requires substantial refuge staff time to attend meetings and review ideas presented by NCDOT

as they go through the design phase. Preparation of the Compatibility Determination (CD), coordination with other offices, public involvement, and assembly of the ROW Permit package also requires substantial refuge staff time. Extensive consultation with the Division of Ecological Services Raleigh Field Office and an intra-Service Section 7 Endangered Species Act consultation will be necessary, as endangered species will be affected by the selected alternative. Cultural and archaeological resource consultation is also required.

There are considerable expenditures for materials and supplies to collect and analyze data, monitor periodic impacts from construction and maintenance activities, monitor right-of-way permit compliance, and coordinate with NCDOT over the project life. Post Hurricane Irene, NCDOT is concurrently planning both phases of the selected alternative – designing/building the bridge replacement (Phase I) and implementing the NC 12 Transportation Management Plan (Phase II). NCDOT is asking the refuge to consider additional right-of-way modifications for Phase II, as well as, maintenance and construction special use permits on NC Highway 12. Refuge management expects continued demands on staff time as Phase II is planned and it could increase substantially depending upon storm frequency and intensity for the remainder of the project life (50-100 years).

Anticipated Biological Impacts of Use:

Phase I Bridge Replacement Project (B-2500):

The NCDOT has requested an amendment to their existing right-of-way (ROW) for NC Highway 12 to construct the new Herbert C. Bonner replacement bridge (see attached map and Compensatory Mitigation Plan for specifics). The ROW modification is allowable provided that it is determined to be minor and for the purpose of providing a safer highway (50 CFR 26.41; 603 FW 2). Compensatory mitigation must be provided so as to result in no net loss of habitat quantity and quality on refuge land. The mitigation described herein was prepared by a team of professional wildlife biologists and is intended to be fully compliant with the U. S. Fish and Wildlife Service Compatibility Policy (603 FW 2) and with the guidance of the Service's Mitigation Policy (501 FW 2).

Direct Impacts:

The proposed new ROW alignment for constructing the Phase I replacement bridge for the Bonner Bridge will have direct impacts on a total of 1.15 acres of Refuge land.

However, this new ROW acreage estimate does not consider all direct, indirect, and cumulative impacts accruing from highway construction and maintenance in the vicinity of the project. Due to the intensity of development that will occur beyond replacing the bridge, the overall area will be highly impacted during and after construction of the new bridge. The Refuge Manager considered direct and indirect impacts of the use as well as collateral and cumulative impacts to refuge habitat (603 FW 2.11B(3)). Our analysis examined the overall area that will be impacted from the proposed use and concluded that there will be additional impacts beyond the 1.15 acres of refuge land to be included in the new ROW. These additional areas and uses include the existing ROW for NC 12 including the Bonner Bridge with associated rock revetment, the Old Coast Guard Station Road ROW, Temporary Construction Easements, and the Terminal Groin.

Indirect and Cumulative Impacts:

Old Coast Guard Station Road: Established in the 1950's, road ROW, originally part of NC 12, extended from the current intersection with NC 12 to a ferry terminal at Oregon Inlet. It went

through the 10-acre in-holding where the old Coast Guard Station is located. No impact analysis or mitigation was done at the time. The old Coast Guard Station was decommissioned in the late 1980's and the road has not been maintained to any standards for safe transportation since that time. The unregulated segment of road right-of-way south of the Old Coast Guard Station has been used opportunistically by the public for access to the beach and periodically by NCDOT and the U.S. Army Corps of Engineers as a staging area for bridge, road, and navigation channel maintenance. The remainder of the Old Coast Guard Station Road ROW which was located north of the in-holding is presumed to be abandoned, and, therefore, part of the Refuge. The 10 acre in-holding surrounding the Old Coast Guard Station has been made available to the design-build contractor if the contractor needs to use it as a staging area. NCDOT has placed a condition on this use requiring contractors to pave the road and staging area to standard specifications for highways and parking lots. These types of activities on this unmaintained road right-of-way create fragmentation and disturbance impacts to the Refuge and those wildlife species using or inhabiting the land. **There are 2.23 acres of impacts associated with these project related uses.**

Existing NC 12 Right-of Way: In 1963, the current NC 12 ROW affected by the B-2500 project was established by amending the original ROW Permit/Easement to tie the Bonner Bridge to the rest of NC 12. At the time, no impact analysis or mitigation was completed for this use of Refuge land. The past impacts are part of the baseline and are not counted in this analysis. The proposed use produces future impacts because the plan is to retain the portion of the old bridge attached to the Refuge, the associated rock revetment, and a section of old NC 12. These concrete, rock, and asphalt features cause fragmentation, disturbance, and decreased diversity impacts that will continue over the project life; anticipated to be at least the first 50 years of the use. **There are 6.6 acres of impacts associated with these project related uses with a net impact of 6.595 acres as described in the attached Mitigation Plan after project completion.**

Temporary Construction Easements: Temporary construction easements are often necessary to facilitate construction. Depending upon the nature of construction, activity occurring in these easement areas will cause habitat impacts. Although the acreage will return to a refuge use at the end of construction, the value of the habitat is degraded. Restoration can compensate for some of this loss in value, but, due to the loss in habitat value over time, mitigation at some rate is required to achieve the legal requirement of no net loss in habitat quantity or quality. **Approximately 0.457 acre will be impacted by these project related uses with a net impact of 0.228 acre as described in the attached Mitigation Plan after project completion.**

The Terminal Groin: Designing this bridge replacement and highway maintenance project (Project) around the assumption that the Terminal Groin must remain in place links the Terminal Groin to the proposed use in this Compatibility Determination as an indirect and cumulative impact. The Terminal Groin will remain in place for the life of the Project under a new, separate ROW Permit requested by NCDOT.

A summary of the findings and recommendations of the Terminal Groin Coastal Expert Panel reveals the following information concerning impacts from the terminal groin:

- Terminal groin impacts at Oregon Inlet/Pea Island NWR include:
 - The terminal groin has caused a very rapid decrease in the overall width of the inlet due to the stabilization of the southern inlet shoulder and the continued migration of the northern shoulder on Bodie Island.

- The terminal groin has altered sediment transport leading to a redistribution of sand, especially into the area behind the groin fillet. This sand is much finer than normal refuge beach sand, which has an impact on habitat quality for filter feeders such as Coquina clams and mole crabs.
- Sand accumulating in the fillet area down-drift from the groin is measurably finer than the open beach exposures with a higher percentage of dark heavy minerals.
- The greatest impact appears to be correlated with redistribution of finer grain sands containing a higher heavy mineral content on swash zone invertebrates. Mole crabs and coquina do not survive as well in finer grained substrate so populations have been suppressed since the early 1990's. This has potential for affecting the quality of migratory bird foraging habitat.
- Habitat distribution has changed as a result of terminal groin placement.
- Habitat within the fillet and behind the groin undergoes rapid succession as the groin disrupts normal overwash processes and sediment transport. Overwash terrace habitat quickly transitions into vegetated dune communities.
- The groin fixed the location of the northern shoreline of the refuge as well as the navigation span channel for the bridge causing the channel to become deeper as the inlet narrows.

Riggs, et al., further address the dynamics of the Oregon Inlet Terminal Groin and its effect on the adjacent refuge lands (2009; 2011a; 2011b).

Since the Terminal Groin is being considered under a separate Compatibility Determination (CD) and Permit, the **"Stipulations Necessary to Ensure Compatibility"** in the Terminal Groin CD are not addressed in this CD for the new bridge ROW Permit. However, the Terminal Groin stipulations found in its CD and the terms and conditions in its Permit must be met as a stipulation necessary to ensure the new bridge ROW is compatible.

Phase II, Transportation Management Plan:

Phase II impacts are linked to the direct, indirect, and cumulative impacts of the use. This analysis includes indirect and cumulative impacts associated with the use when conducted in conjunction with other existing or planned uses of the Refuge, and uses of adjacent lands or waters that may exacerbate the effects of a refuge use (603 FW 2.11B(3)). At this time, it is not possible to describe the specific impacts in terms of loss of quantity and quality of habitat. However, Phase II has been implemented concurrent with Phase I as a result of Hurricane Irene impacts on NC 12 in August 2011. So, using the information in the ROD and information provided by NCDOT at Phase II planning meetings, it is possible to describe potential impacts associated with the various proposals and alternatives presented by NCDOT. Consequently, those anticipated impacts are partially addressed in the section under the heading, **"Stipulations Necessary to Ensure Compatibility"** for the Phase I new bridge ROW Permit. It is anticipated that additional stipulations will be included in any future Compatibility Determination associated with Phase II proposed uses.

After reviewing the available information and according to my best professional judgment, I find that the Phase I Bridge Replacement right-of-way modification requested by NCDOT complies with the standards for a minor modification and can be found to be compatible with the mission of the National Wildlife Refuge System and the purpose for establishing Pea Island National Wildlife Refuge. This determination is conditional upon full compliance with all Stipulations Necessary to Ensure Compatibility and the terms and conditions in a new ROW Permit.

Public Review and Comment: Notice of this draft Compatibility Determination was released to local newspapers, local radio and television stations, the Dare County Public Library, and will be posted on the Refuge web page as well as the office bulletin board near our main entrance for a period of no less than 14 days. Comments received will be addressed and incorporated as an Appendix to this document

Determination:

_____ Use is Not Compatible

X Use is Compatible With the Following Stipulations

Stipulations Necessary to Ensure Compatibility: These stipulations were prepared to ensure that the Refuge purpose can be achieved with the NC Highway 12 ROW modification in place. They are based upon findings of the Refuge Manager, Refuge Biologist, coastal ecologists, wildlife biologists, and a panel of coastal experts.

A team of three professional wildlife biologists prepared a Compensatory Mitigation Plan (see attached) to substantiate the best professional judgment of the Refuge Manager to ensure no net loss of habitat quantity and quality due to the proposed use.

A. The required Compensatory Mitigation is identified in I., and II., as follows:

- I. Old Coast Guard Station In-holding (10 acres)
 - a. The 10-acre parcel known as the Old Coast Guard Station property shall be transferred in entirety to the U. S. Fish & Wildlife Service to be added to Pea Island National Wildlife Refuge. The State of North Carolina and the County of Dare shall relinquish any and all rights, reservations, or any other encumbrances associated with said property.
 - b. The historic building known as the Old Coast Guard Station may either remain in place or be removed from the property to an off-refuge site.
 1. If the building remains in place NCDOT or the State of North Carolina shall be responsible for maintenance at intervals sufficient to preserve and protect the historic properties of the building.
 2. To allow viewing of the cultural resource, NCDOT shall design and construct a boardwalk and observation deck from the northeastern corner of the existing parking lot adjacent to NC 12. Final alignment and design of the boardwalk and observation deck shall be subject to the approval of the Refuge Manager.
 - c. All other buildings, pavement, concrete, water lines septic tanks/lines, fuel tanks/lines or any hazardous materials, and debris shall be removed from the entire 10-acre parcel to the satisfaction of the Refuge Manager prior to transferring the property.
- II. Old Coast Guard Station Road Right-of-Way (2.23 acres)
 - a. The Old Coast Guard Station Road Right-of-Way shall be declared abandoned allowing the rights to revert to refuge. The State of North Carolina shall relinquish all rights, reservations, or any other encumbrances associated with said property.

- b. All asphalt and any associated materials related to highway construction, operation, and maintenance shall be removed from the abandoned right-of-way per 50 CFR 26.41(c).
- c. The Refuge will work with the N. C. Department of Transportation for future access to manage habitat in the fillet adjacent to the Terminal Groin.

B. The remaining stipulations necessary to ensure compatibility follow:

III. Monitoring and Modeling

NCDOT shall provide funding for the development of model(s) described by the USFWS designed to provide the required inputs and outputs for answering "if-then" statements. These models would predict the kinds of changes (in area, arrangement, location, quality) to Refuge habitat and the vulnerability of NC 12 from coastal processes such as overwash events (storm effects), erosion (shoreline regression, dune/berm changes, elevation changes), sea level rise, road location, and berm location and size. Results from this modeling would facilitate decision making with regard to NCDOT maintenance activities and refuge management actions

IV. Bridge Guard Rail Modifications

Bird/vehicle strikes on the Bonner Bridge and other area bridges have resulted in substantial mortality in resident and migratory birds. The U. S. Fish and Wildlife Service is responsible for the protection and conservation of migratory birds (Migratory Bird Treaty Act {MBTA: 16 USC § 703 et seq.}). The Refuge is responsible for protecting migratory birds from harm or harassment within the Pea Island National Wildlife Refuge and the Presidential Proclamation Boundary. This Proclamation established a regulation designating as a closed area certain lands and waters within and adjacent to, and in the vicinity of the Refuge – its exterior boundary is described in the Federal Register {Vol. 3 No. 93 Thursday, May 12, 1938}. Consequently, the following shall be implemented:

- a. Commencing upon entry into the Pea Island National Wildlife Refuge boundary, the Phase I Parallel Bridge guardrail design shall incorporate structural elements to force birds up and above traffic, including large trucks, when crossing over the bridge. These structural elements must be designed to the satisfaction of the Refuge Manager and shall extend along both sides of the bridge from the northern crossing of the Refuge boundary to the southern terminus of the bridge on the Refuge. Also, it is strongly encouraged that the same structural elements be installed to the north exterior boundary of the Presidential Proclamation closed area and optimally on the entire bridge.
- b. The NCDOT shall establish a monitoring program wherein statistically valid data regarding bird mortality on the bridge is documented on a continuous basis and the effects of mitigating structures are measured for comparison to baseline conditions by gathering data on other area bridges.

V. Exotic/Invasives Control

With the introduction of offsite construction materials and through ground disturbances, the potential for exotic and invasive species introduction increases. Consequently, NCDOT shall:

- a. Incorporate monitoring for the introduction of invasive and/or exotic species to the refuge as a result of highway construction, operation, and maintenance within any and all easement areas wherein NCDOT or the State of North Carolina is identified as the holder of the easement.
- b. Upon discovery of an exotic or invasive species by refuge staff or NCDOT within the ROW, NCDOT shall notify the Refuge and initiate control measures upon Refuge approval.

- C. In addition, 50 CFR 29.21-4 specifies 15 terms and conditions to be included in the ROW Permit issued in response to the NCDOT request. By reference, these terms and conditions are hereby considered to be a part of this Compatibility Determination and will be included (or minor variations thereof) in the ROW Permit.

Justification: The Phase I Bridge is being designed to meet standards for a minor modification to reduce the level of impact on Pea Island National Wildlife Refuge. Assuming full compliance with the Stipulations in this CD and the terms and conditions in a ROW Permit to be prepared for this project there should be no net loss in habitat quantity or quality with this minor modification to existing right-of-way.

NEPA Compliance:

Categorical Exclusion _____
Environmental Assessment _____
Environmental Impact Statement X*
FONSI _____

X* = by reference - The NCDOT record of NEPA documentation and the selected alternative can be viewed at <http://www.ncdot.org/projects/bonnerbridgerepairs/>.

References

Dolan, R., Dean, R., Hayden, B., McCafferty, H., Erwin, M., Richardson, D., Stewart, D. 2010. Environmental Impacts of the Oregon Inlet/Pea Island Terminal Groin. Coastal Research Associates, Charlottesville, VA. 57pp. plus attachments.

*Federal Highway Administration & North Carolina Department of Transportation. 2010. Record of Decision for NC 12 Replacement of Herbert C. Bonner Bridge (Bridge No. 11) over Oregon Inlet. Federal-Aid No. BRS-2358(15). NCDOT Project Definition: 32635. TIP Project No. B-2500. Dare County, North Carolina

Riggs, S. R., Ames, D. V. , Culver, S. J. , Mallinson, D. J. , Corbett, D. R. , John P. Walsh, 2009. Eye of a human hurricane: Pea Island, Oregon Inlet, and Bodie Island, northern Outer Banks, North Carolina, In *America's Most Vulnerable Oceanfront Communities*, eds., Kelley, J.T., Pilkey, O.H., and Cooper, J.A.G. Geological Society of America Special Paper 460-04, p. 43-72

Riggs, S.R., and Ames, D.V., 2011a. Consequences of human modifications of Oregon Inlet to the down-drift Pea Island, North Carolina Outer Banks. *Southeastern Geology*. 48(3):103-128.

ATTACHMENT I

**COMPENSATORY MITIGATION PLAN
For
MINOR MODIFICATION TO EXISTING RIGHT-OF-WAY
Bonner Bridge – Phase I**